

CLAIMS

We claim:

1. An RF switch comprising:
 - a waveguide structure having at least a first and second port;
 - a dielectric structure defining at least a first cavity disposed at a juncture between said first and second ports; and
 - a fluid control system that moves a conductive fluid into said first cavity in a first operational state and at least partially purges said conductive fluid from said first cavity in a second operational state, and wherein a low loss RF path is formed between said first port and said second port in at least one of said first and second operational states, said first port being substantially isolated from said second port in a different one of said first and second operational states.
2. The RF switch according to claim 1 wherein said low loss RF path is formed between said first port and said second port in said first operational state and said first port is substantially isolated from said second port in said second operational state.
3. The RF switch according to claim 1 wherein said waveguide structure has a third port, and a second dielectric structure defines at least a second cavity disposed at a juncture between said third port and said waveguide structure.
4. The RF switch according to claim 3 wherein said fluid control system moves said conductive fluid into said second cavity in said second operational state.
5. The RF switch according to claim 3 wherein a low loss RF path is formed between said first port and said third port in one of said first and second

operational state, and said first port and said third port are substantially isolated in a different one of said first and second operational states.

6. The RF switch according to claim 3 wherein said first and second dielectric structure are integrally formed as a single unit.

7. The RF switch according to claim 1 wherein said dielectric structure defines a plurality of elongated fluid cavities at said juncture extending between opposing walls of said waveguide structure.

8. The RF switch according to claim 1 wherein a conductive path is provided between said conductive fluid and at least one wall of said waveguide structure.

9. A method for controlling a path of an RF signal, comprising the steps of:
providing a low loss RF path between at least a first and second port of a waveguide in a first operational state; and

substantially isolating said first port from said second port in a second operational state by selectively transferring a conductive fluid into at least one cavity of a first dielectric structure within said waveguide.

10. The method according to claim 9 further comprising the step of transferring said conductive fluid into a plurality of fluid conduits defined within said dielectric structure and extending between opposing walls of said waveguide.

11. The method according to claim 10 further comprising the step of selecting a spacing between adjacent ones of said fluid conduits so as not to exceed about $1/10$ of a wavelength at the operating frequency of the waveguide.

12. The method according to claim 9 further comprising the step of substantially isolating said first port and a third port of said waveguide in said first operational state by transferring said conductive fluid into at least one cavity of a second dielectric structure within said waveguide.

13. The method according to claim 12 further comprising the step of forming a low loss RF path between said first port and said third port in said second operational state by at least partially purging said conductive fluid from said at least one cavity of said second dielectric structure.

14. The method according to claim 12 further comprising the step of integrally forming said first and second dielectric structures as a single structure.